Causal Effect of Municipal Spending for Social Programs on Crime

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Hypothesis: While increased policing has a strong and immediate crime-reducing effect, investments in social programs may have a weaker but still significant effect on crime, over a longer time span.

Background: Many forms of crime are associated with or directly arise out of social disorders, such as poverty, housing and job insecurity, mental illness, and lack of education. Since 1980, public social programs addressing these needs have been disinvested, while the criminal justice system has ballooned in scope and funding to fill this role.

While there is significant evidence that increased policing reduces crime, this effect is both short-lived and associated with significant harm. Incarceration temporarily removes criminalized behavior from the public sphere, but does not prevent recidivism or reduce crime in the long run (Harding 2017). Further, the success of hotspot policing is tempered by unjust and abusive practices, a collateral effect whose costs have not been adequately quantified and compared with the benefits (Kochel 2011).

By addressing the underlying social and economic conditions that lead to crime, social programs rely on a more preventative strategy for reducing crime and violence. Several sociological theories offer potential explanations for these mechanisms of action. For example, educational funding can reduce the strain between legitimate goals and lack of opportunity, as outlined in strain theory (Agnew 1992). Public housing and welfare directly address issues of residential instability and economic deprivation, two structural causes of crime in social disorganization theory (Shaw 1942). All of these social programs aim to redistribute resources, marginally addressing the class inequality as described in conflict theory.

This project seeks to estimate the causal effect of funding social programs (i.e. Medicaid, public housing) on crime, compared to funding police departments. By drawing on a large panel of US cities over 30 years, we hope to uncover broad trends that are agnostic to regional or temporal effects.

Methods: Municipal expenditures for social programs and police departments are collected from the Census Annual Survey of Local Government Finances. Social programs are grouped into four categories: housing, healthcare, education, or welfare. Programs funded at the county and state levels (i.e. Medicaid) are disaggregated to the municipal level. Violent and property crime data are collected for cities from FBI's Uniform Crime Reporting. We thus have panel data for program funding and crime rates for the 400 largest US cities from 1990-2017.

There are several sources of endogeneity that may bias a causal estimate of social program funding on crime: omitted variable bias (e.g. recession affecting both program funding and crime), reverse causality / simultaneity bias (e.g. increased crime leading to increased police funding). To account for this endogeneity, we develop an instrumental variables approach and a fixed effects framework.

Regressor	Proposed Instrument	Wald Test	Exogeneity Plausibility
Welfare funding	Public transit funding –or– Parks & recreation funding	183.2 12.6	Public spaces could provide more opportunities for crime
Healthcare funding	Public utilities funding	44.2	Likely exogenous
Education funding	Enrollment in special education (Cullen 1997)		Likely exogenous; documented in literature
Housing funding	Variations in low-income housing stock (LIHTC)		Public housing could be constructed in response to homelessness-associated crime
Police funding	Firefighter funding (Levitt 2002)	84.7	Likely exogenous; documented in literature

We need at least as many instruments as we have endogenous social programs, in order to estimate unbiased coefficients. We have identified several potential candidates from both existing literature and

our own dataset (see table above). Most of the instruments are strongly correlated with their respective regressors, with an F-statistic from the Wald test >10 (establishing relevance). We also briefly discuss above the likelihood that these instruments have an independent effect on crime (exogeneity condition).

Using these instruments, our two-stage least squares regression is as follows:

$$Program^{p}_{i,t} = \sum_{q \in \mathcal{P}} \left(\alpha_{p,q} IV^{q}_{i,t}\right) + X'_{i,t}\gamma + Z'_{i}\rho + W'_{t}\theta + \mu_{i,t} \qquad (1)$$

$$Crime_{i,t+lag} = \sum_{p \in \mathcal{P}} \left(\beta_{p} \widehat{Program}^{p}_{i,t}\right) + X'_{i,t}\nu + Z'_{i}\omega + W'_{t}\tau + \epsilon_{i,t} \qquad (2)$$

$$\widehat{\lambda_{p}} = \frac{\sum_{q \in \mathcal{P}} \widehat{\beta_{q}} \widehat{\alpha_{p,q}}}{\widehat{\alpha_{p,p}}} \qquad (3)$$

$Program^{p}_{i,t}$ is the dollars of funding allocated to social program *p* for city *i* in year *t*, normalized by population. $IV^{p}_{i,t}$ is the value of the instrumental variable corresponding to program *p*. $Crime_{i,t+lag}$ is the crime rate for city *i*, at a designated number of years (*lag*) after program funding. In the first stage, we regress each social program on every instrument by OLS. We save the predicted values $\widehat{Program}^{p}_{i,t}$, and regress crime on these predicted values in the second stage. The IV estimate $\widehat{\lambda_{p}}$ can then be isolated by dividing the reduced-form estimates by the first-stage estimates, as shown in eq (3).

We include a set of sociodemographic controls ($X'_{i.t}$) for city *i* in year *t* to control for some observed confounders: racial/ethnic composition, age distribution, and education levels. We also include set of city fixed-effects (Z'_{i}) to control for unobserved characteristics unique to cities, as well as a set of time fixed-effects (W'_{t}) to control for unobserved time trends common to all cities.

Manipulating the *lag* variable (i.e. –5 to +5 years) allows us to test for reverse causality, as well as investigate effects over different time horizons. For example, policing may have an immediate effect on crime, while investments in mental health may not materialize in crime reduction until several years later.

Intellectual Merit: This project seeks to better understand the causal relationships between social programs, social disorder, and crime. Our results will build on strain theory, social disorganization theory, and conflict theory.

Our preliminary results suggest that while policing has a strong and immediate effect on crime, social programs have a weaker but still significant crime-reducing effect, potentially over a longer time scale. This suggests that social programs are long-term investments that may alter the ecological landscape of marginalized communities, while policing is a targeted intervention that addresses crime with spatial and temporal specificity.

Future studies could investigate mechanisms of action by drawing on qualitative methods and causal chains. Ethnographies and interviews with program participants may provide insights into how social programs reduce the conditions for crime; e.g. expand public housing → reduce housing insecurity → reduce property crime. These proposed causal chains could be tested with further causal studies, to better understand the processes that link social programs with crime.

Broader Impacts: This project aims to contribute a more nuanced understanding of the tradeoffs of expanding social programs vs. expanding policing, to inform evidence-based policymaking that can materially improve the conditions for marginalized communities.

Based on our preliminary results, social programs would require significantly more resources than police departments to yield the same marginal reduction in crime. In this case, solely diverting police funding to social programs would be insufficient to manage violence and crime. Additional funds would need to be secured from other federal programs or redistributed through tax reform.

Historical disinvestment in segregated communities of color limits access to education and healthcare, while concentrating exposure to violence, reproducing poverty. By better understanding these interactions, we hope to inform policy that takes a more systemic approach to addressing the interconnected needs of marginalized communities.